

## CLAIMS

What is claimed is:

1. A clock generation system, comprising:  
a redundant clock source (RCS) device for receiving multiple timing signals and for generating at least one clock from said timing signals for distribution to other circuits; and  
first and second hot-swappable oscillator (HSO) devices that each comprise a base housing and an oscillator unit for generating a timing signal, said base housing including an interconnect for coupling to said oscillator unit, said interconnect providing a first connection for said timing signal and providing a second connection to enable detection of insertion and removal of said oscillator unit;  
wherein said RCS device switches between timing signals from said first and second HSO devices in response to oscillator unit removal detected through said interconnect and switches between timing signals in response to timing signal failure.
2. The clock generation system of claim 1 further comprising:  
an external input port for receiving a clock from another circuit, wherein said RCS synchronizes said at least one clock to said received clock.
3. The clock generation system of claim 1 further comprising:  
an external output port for providing said at least one clock to another circuit.
4. The clock generation system of claim 1 wherein each of said first and second HSO devices comprises a cover element that has an oscillator board coupled to said oscillator unit.
5. The clock generation system of claim 4 wherein said base housing comprises guide structure for receiving said oscillator board to align said oscillator unit to couple with said interconnect.

6. The clock generation system of claim 4 wherein said cover element comprises a plurality of latches for mechanically coupling said cover element to said base housing that are releasable by manual depression.

7. The clock generation system of claim 4 wherein said cover element comprises a light emitting element to indicate a functional state of said oscillator unit.

8. The clock generation system of claim 1 wherein said RCS device is implemented on a circuit board coupled to a backplane circuit board.

9. A method of performing clock generation for electronic equipment, comprising:  
coupling a redundant clock source (RCS) to a backplane;  
coupling a plurality of hot-swappable oscillator (HSO) units to said backplane through respective multi-level interconnects, each of said multi-level interconnects providing a first level for connecting a timing signal and providing a second level to enable detection of insertion and removal of a respective HSO unit;  
generating, by said RCS, a clock for distribution through said backplane from a timing signal received from one of said HSO units;  
detecting, by said RCS, disconnection of said second level of one of said multi-level interconnects by said redundant clock source; and  
switching, by said RCS, to a timing signal from another HSO unit for generation of said clock before said respective timing signal from said HSO unit associated with said disconnection becomes unavailable.

10. The method of claim 9 further comprising:  
providing said clock to an external port for communication to another backplane.

11. The method of claim 9 further comprising:  
receiving a timing signal from another backplane; and  
synchronizing, by said RCS, said clock to said timing signal.

12. The method of claim 9 wherein said coupling a plurality of HSO units comprises: inserting cover elements of said HSO units into base housing units that are mechanically fastened to said backplane.

13. The method of claim 12 wherein each base housing unit comprises guide structures to receive a circuit card of a respective cover element to align said circuit card to couple with a respective multi-level interconnect.

14. The method of claim 12 wherein each cover element comprises a plurality of latches for mechanically coupling said cover element to a respective base housing unit.

15. The method of claim 12 further comprising:  
releasing a cover element of an HSO unit by manual depression of said plurality of latches.

16. The method of claim 12 wherein each cover element comprises a light emitting element to indicate a functional state of timing signal generation.

17. The method of claim 12 wherein said coupling said RCS comprises:  
coupling a circuit board containing circuitry for clock generation to said backplane.

18. A clock generation system, comprising:  
a redundant clock source (RCS) means for receiving multiple timing signals and generating at least one clock using one of said timing signals; and  
a plurality of hot-swappable oscillator (HSO) means for providing said timing signals to said RCS means, wherein each HSO means comprises an oscillator unit for generating a respective timing signal and a base housing having a first level of an interconnect for communication of the respective timing signal and a second level of said interconnect for communication of a signal indicative of whether the oscillator unit is fully engaged with said interconnect;

wherein said RCS means switches between timing signals from said plurality of HSO means in response to detection of removal of an oscillator unit from a respective interconnect.

19. The clock generation system of claim 18 wherein said RCS means and said plurality of HSO means are coupled to a common backplane circuit board.

20. The clock generation system of claim 18 wherein each base housing comprises guide structures for aligning a respective oscillator unit for insertion with the interconnect.